Name: _____

Phone/Email Contact: _____

California Department of Water Resources
Central Valley Flood Protection Plan Implementation: Basin-Wide Feasibility Studies and Conservation Strategy

Getting to Measurable Objectives

Technical Workshop

PREWORK AND SESSION WORKBOOK

May 2, 2013
9:00 am to 12:30 pm
City of West Sacramento City Hall
Galleria Room
1110 West Capitol Ave.,
West Sacramento, CA 95691

How to Submit Workbook Comments

Workbook comments may be submitted:

1. In person at the May 2, 2013 Technical Workshop
2. Electronically by **Thursday, May 9, 2013**
   - Submit electronically to cvfmp@water.ca.gov
   - Comments should be captured in the "Comments" column of the workbook. Please indicate the specific potential metric to which each comment applies.
   - Make sure to include your name and contact information in the workbook.
3. Via Fax Number 916-574-1053 by **Thursday, May 9, 2013**
4. By mail-- must arrive by **Thursday, May 9, 2013:**
   Attn: May 2 DWR Workshop, P.O. Box 942836, Sacramento, CA 94236

FloodSAFE CALIFORNIA DEPARTMENT OF WATER RESOURCES

WORKSHOP PURPOSE

The May 2, 2013, Getting to Measurable Objectives Technical Workshop will focus on the approach for developing measurable objectives as part of the State-led Basin-Wide Feasibility Studies and Central Valley Flood System Conservation Strategy.

Technical workshop goals include the following:

- Describe the process by which Basin-Wide Feasibility Studies and Central Valley Flood System Conservation Strategy "measurable objectives" are being developed.
- Provide an overview of the draft objective topics and types of metrics, and receive public input.
- Provide an overview of the approach for developing detailed measurable objectives, and receive public input.

PRE-WORK

To help you prepare for the May 2, 2013, Getting to Measurable Objectives Technical Workshop, the following pre-work is suggested:

- **Attend Orientation**: Basin-Wide Feasibility Studies/Conservation Strategy Orientation Briefings were conducted in March, 2013. If you were not able to attend a briefing, please review a session recording: http://www.water.ca.gov/cvfmp/bwfs/20130319_BWFS_CVFSCS_Webinar.wmv

  A copy of the briefing presentation is also available on the web: http://www.water.ca.gov/cvfmp/meetings/docs/20130321_BWFS_CS_WebinarPresentation_Final.pdf

- **Review the workbook contents and make notes:** Information you review and prepare in advance will be used during the session.

POST-WORKSHOP

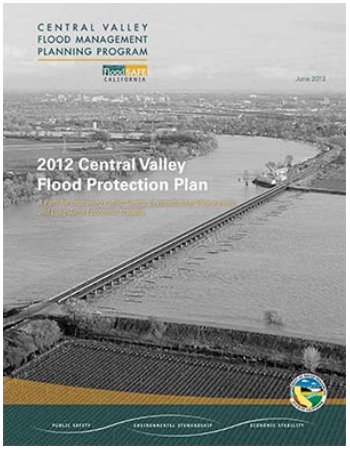
In addition to submitting comments at the workshop, you are also invited to use this workbook to submit additional comments (see instructions on the cover for submitting workbook comments).

HOW TO USE THIS WORKBOOK

This workbook contains the following information:

- Background and context information
- Description of the process used to develop measurable objectives for the Basin-Wide Feasibility Studies and Central Valley Flood System Conservation Strategy
- Table containing draft ***objective topics*** and potential ***metrics***, with blank spaces for your comments and input. Please be sure to review the draft objective topics and potential metrics in the workbook prior to the workshop, as part of your pre-workshop preparations.

Background and Context



Central Valley Flood Protection Plan

Historically, California's Central Valley has experienced some of State's largest and most damaging floods. The devastating effects of floods on life, property and the State's economic prosperity inspired passage of the Central Valley Flood Protection Act (Act) of 2008. This Act requires the California Department of Water Resources (DWR) to develop, and update on regular cycle, a sustainable, integrated flood management plan – the ***Central Valley Flood Protection Plan (CVFPP).*** The Central Valley Flood Protection Board adopted the first CVFPP in June 2012.

The 2012 CVFPP describes a long-term, systemwide approach for improving flood management in the Central Valley: the ***State Systemwide Investment Approach***. The State Systemwide Investment Approach includes two types of physical actions: (1) regional improvements that address local and regional flood management needs; and (2) long-term, systemwide improvements to the State Plan of Flood Control that provide cross-regional benefits and improve overall flood system function, flexibility, and resiliency.

Basin-Wide Feasibility Studies

As part of a long-term implementation planning, the 2012 CVFPP proposed State-led feasibility studies to refine a systemwide set of flood management improvements to the State Plan of Flood Control, beginning with the physical elements in the State Systemwide Investment Approach. Accordingly, DWR has initiated two ***Basin-Wide Feasibility Studies (BWFS)***, one in the Sacramento River Bain and another in the San Joaquin River Basin**.**

The purpose of the BWFS is to evaluate the feasibility of different alternatives for improving the flood management system, consistent with the SSIA, including:

- Improving flood management system flexibility and resiliency through expansion and extension of the flood bypass system and other system improvements.
- Integrating ecosystem enhancements and other multi-objective projects with systemwide flood management improvements.
- Combining regional improvements with system improvements to identify the State's systemwide investment package.

The BWFS will inform the 2017 update of the Central Valley Flood Protection Plan and development of a FloodSAFE Financing Plan.

Central Valley Flood System Conservation Strategy

The Central Valley Flood Protection Act of 2008 identifies three environmental goals:

1. Promote natural dynamic hydrologic and geomorphic processes.
2. Increase and improve the quantity, diversity, and connectivity of riparian, wetland, floodplain, and shaded riverine aquatic habitats, including the agricultural and ecological values of these lands.
3. Promote the recovery and stability of native species populations and overall biotic community diversity.

In order to achieve these environmental objectives in conjunction with flood management improvements, DWR is developing the ***Central Valley Flood System Conservation Strategy*** (Conservation Strategy). The

Conservation Strategy will provide the systemwide context and direction for DWR's environmental activities related to improving integrated flood management in the Central Valley. It will provide measurable ecological objectives for ecosystem processes, habitats, and species, and for planning and design of improvements to the flood management system. The Conservation Strategy will also describe the approach to attaining these objectives, including adaptive management during implementation. The Conservation Strategy will be incorporated into the 2017 update of the CVFPP.

The Conservation Strategy aims to:

- Clarify the importance of and need to incorporate environmental improvements into flood management activities and the extent of needed environmental improvements.
- Promote physical environmental improvements that also benefit the flood management system.
- Provide goals and measurable objectives that can be used to monitor progress, within the context of the goals of the 2012 CVFPP, the Central Valley Flood Protection Act of 2008, and the FloodSAFE California initiative.
- Describe management actions for integrating conservation into multi-benefit projects to attain the goals and objectives.
- Present an adaptive management–based approach to implementation that uses monitoring and evaluation to guide implementation.
- Provide a scientific and planning foundation upon which to develop more specific plans for programmatic and project environmental permits.

Development of Measurable Objectives

Objectives are under development for the BWFS and Conservation Strategy. They articulate what the State Systemwide Investment Approach will accomplish, without prescribing specific actions or projects to achieve them. Objectives stem from the primary and supporting goals of the 2012 CVFPP, the authorizing legislation for the CVFPP, and identified problems and needs associated with facilities and lands protected by the State Plan of Flood Control.

CVFPP Goals

Primary Goal:

- Improve flood risk management

Supporting Goals

- Promote ecosystem functions
- Improve operations and maintenance
- Improve institutional support
- Promote multi-benefit projects

A variety of objectives are being developed to guide refinement of the State Systemwide Investment Approach. Objectives are grouped by the CVFPP Goals, then by more specific objective topics.

CVFPP Goals → Objective Topics → Measurable Objectives

The development of ***measurable objectives*** will allow monitoring and measurement of progress in achieving CVFPP Goals. For that reason, objectives must be relevant to the problems being addressed, and achievable (through feasible actions). ***Metrics*** are the means for measuring the extent to which objectives are (or can be) achieved. Some metrics are quantifiable (numerically), while others are qualitative in nature. Various potential metrics are being considered by DWR as part of the iterative process for developing measurable objectives.

Metrics are one component of measureable objectives, and are the topic of this technical workshop. Other components include magnitude or quantity, and time. These components will be topics of future workshops and engagements.

CVFPP Quick Facts

- *For urban and urbanizing areas* with greater than 10,000 residents, the 2012 CVFPP supports achieving a high level of flood protection, consistent with state law requiring cities and counties to achieve an urban level of flood protection.
- *For small communities (less than 10,000 residents),* the 2012 CVFPP describes achieving a 100-year level of flood protection, where feasible
- *For rural-agricultural areas,* the 2012 CVFPP describes improving flood protection consistent with the preservation of rural-agricultural activities and viable local economies, encouragement of land uses compatible with periodic flooding, and integration of actions to improve ecosystem services and functions.

Definitions

- ***Flood system flexibility*** is the ability of a flood management system to adapt to changing conditions, such as changing hydrologic, social, political, regulatory, or ecological conditions. A more flexible flood system can provide adaptive capacity in the face of climate change and help make investments in local and regional flood protection more enduring in the face of future hydrological uncertainties.
- ***Flood system resiliency*** relates to the ability of the flood management system to continue to function and/or recover quickly after damaging floods. Increased flood system resiliency can be achieved through increasing robustness of flood management improvements; adapting measures that reduce the time and cost of flood recovery; improving emergency preparedness, emergency response, and flood recovery planning; and improving system redundancy, particularly in high-risk areas. Designing a levee to withstand overtopping without failure is an example of an action to improve resiliency.
- In the context of wise floodplain management, ***nonstructural actions*** refer to actions taken in a floodplain that would reduce or eliminate susceptibility to flooding, such as the construction of floodwalls, floodproofing or relocating structures, zoning, and designating or acquiring flood prone areas.
- ***Objectives*** define what an action or plan will accomplish. ***Measureable objectives*** include components for quantity/magnitude (how much) and time (when the objective should be accomplished).
- ***Metrics*** are the means for measuring the extent to which objectives are (or can be) achieved. Some metrics are quantifiable (numerically), while others are qualitative in nature.

Abbreviations and Acronyms Used in this Workbook

BWFS = Basin-Wide Feasibility Studies

cfs = cubic feet per second

Conservation Strategy = Central Valley Flood System Conservation Strategy

CVFPP = Central Valley Flood Protection Plan

DWR = California Department of Water Resources

EAH = expected annual habitat

O&M = Operations and Maintenance

SPFC = State Plan of Flood Control

SRA = shaded riverine aquatic

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Draft Objective Topics and Potential Metrics for CVFPP Basin-Wide Feasibility Studies and Conservation Strategy

CVFPP Goal	Objective Topics	Potential Metrics	Comments ✓ *Are these the appropriate metrics for the objective topic? If not, what other metrics should be considered?* ✓ *Which potential metric(s) would be most effective in measuring the objective topic?*
Improve Flood Risk Management	**1. People and Property at Risk –** Reduce flood risks to people and property within floodplains protected by the State Plan of Flood Control		
	1a. Urban Flood Protection	1) Annual probability of flooding (% probability) in urban areas 2) Risk to human life, health, and safety (%) in urban areas 3) Damages to property and infrastructure ($) in urban areas 4) Economic effects on regional economies ($, employment)	
	1b. Small Community Flood Risk Reduction	1) Annual probability of flooding (% probability) for small communities 2) Risk to human life, health, and safety (%) in small communities 3) Economic damages ($) to small communities 4) Number of small communities with 100-year flood protection 5) Number of nonstructural[3] actions in small communities	
	1c. Rural-agricultural Area Flood Risk Reduction	1) Annual probability of flooding (%) in rural-agricultural areas 2) Risk to human life, health, and safety (%) in rural areas 3) Damages to property, crops, infrastructure ($) in rural areas 4) Economic effects on local economies ($, employment) 5) Potential miles of rural levee that are accessible under all weather conditions 6) Number of nonstructural[3] actions implemented within rural-agricultural floodplains	
	2. Flood System Flexibility – Improve the ability of the flood management system to adapt to changing conditions (hydrologic, social, political, regulatory, or ecological conditions)		
	2a. Flood System Flexibility	1) Peak flood stage (or freeboard) that can be safety accommodated (feet) 2) Peak flood flows (cubic feet per second) that can be safety conveyed 3) Increase in flood frequency, peak flood volume, or peak flow (% increase) that can be safety accommodated 4) Increase in operational flexibility (ability to manage the timing and magnitude of flood peaks in real time) 5) Increased flood warning time (% or hours/days) to support real-time operational flexibility and/or flood preparedness	

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Draft Objective Topics and Potential Metrics (Continued)

CVFPP Goal	Objective Topics	Potential Metrics	Comments ✓ *Are these the appropriate metrics for the objective topic? If not, what other metrics should be considered?* ✓ *Which potential metric(s) would be most effective in measuring the objective topic?*
Improve Flood Risk Management (cont.)	**3. Flood System Resiliency –** Improve the ability of the flood management system to continue to function and recover quickly after damaging floods		
	3a. Flood System Resiliency	1) Reduction in economic damages ($ or %) with and without added resiliency measures 2) Number of resiliency measures implemented in high-risk areas 3) Reduction in cost of post-flood recovery efforts ($ or %) 4) Number of emergency preparedness and flood recovery plans, or % of populated areas with flood recovery plans	
	4. Wise Floodplain Management – Wisely manage floodplains protected by the SPFC to manage residual risks, particularly in areas of deep or rapid flooding		
	4a. Wise Floodplain Management	1) Total acres or % of floodplains with flood-compatible land uses preserved (through easements or other means) 2) Number of land-use plans compatible with floodplain risks and functions 3) Number of nonstructural actions implemented within SPFC floodplains	
Promote Ecosystem Functions	**5. Ecosystem Processes –** Improve and enhance natural dynamic natural hydrologic and geomorphic processes		
	5a. Inundated Floodplain	1) Total amount (acres, expected annual habitat (EAH) units) with sustained spring and 50-percent frequently activated floodplain 2) Total amount of expected annual inundated floodplain habitat (acres)	
	5b. Riverine Geomorphic Processes	1) Natural Bank—total length (miles) 2) River Meander Potential—total amount (acres)	
	6. Habitats – Increase and improve quantity, diversity, quality, and connectivity of riverine aquatic and floodplain habitats		
	6a. Shaded Riparian Aquatic (SRA) Cover	1) Shaded Riverine Aquatic Cover and Bank and Vegetation Attributes of SRA Cover—total length (miles) 2) Total length and % of bank affected by flood projects that incorporate SRA attributes	
	6b. Riparian	1) Habitat Amount—total amount (acres) 2) Habitat Connectivity—median patch size (acres) and perimeter-to-area ratio	
	6c. Marsh	1) Habitat Amount—total area (acres) 2) Habitat Connectivity—median patch size (acres) and perimeter-to-area ratio	
	6d. Floodplain Agriculture	1) Habitat Amount—total amount (acres) of wildlife-friendly floodplain agriculture	

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Draft Objective Topics and Potential Metrics (Continued)

CVFPP Goal	Objective Topics	Potential Metrics	Comments ✓ *Are these the appropriate metrics for the objective topic? If not, what other metrics should be considered?* ✓ *Which potential metric(s) would be most effective in measuring the objective topic?*
Promote Ecosystem Functions (cont.)	**7. Species –** Contribute to the recovery and stability of native species populations and overall biotic community diversity		
	7a. Threatened and Endangered Target Species	1) Species specific metrics are being developed for 17 targeted species, for inclusion as part of design features and restoration actions	
	8. Stressors – Reduce stressors related to the development and operation of the flood management system that negatively affect important species		
	8a. Revetment	1) Revetment Removed to Increase Meander Potential and/or Natural Bank (without negatively affecting flood safety)—total length (miles)	
	8b. Levees	1) Levees Relocated to Reconnect Floodplain or Improved to Eliminate Hydraulic Constraints on Restoration (where consistent with flood risk management)—total length (miles) 2) Miles and % of flood channel with adequate capacity to support riparian vegetation	
	8c. Fish Passage Barriers	1) Number of fish passage barriers removed	
	8d. Diversions	1) Number of diversions screened or removed 2) Miles of additional habitat accessible upstream	
	8e. Invasive Plants	1) Invasive Plant-Dominated Vegetation—total area (acres)	
Improve Operations & Maintenance	**9. Long-term Cost of O&M –** Reduce the long-term cost of SPFC O&M through more sustainable physical conditions and improved facility reliability		
	9a. Cost of O&M	1) Reduction in long-term O&M costs ($ or %) 2) Reduction in long-term repair costs ($ or %) 3) Reduction in ecosystem stressors or constraints (see also metrics under 8. Stressors)	
	10. Consistent and Efficient O&M Practices – Develop SPFC maintenance practices that reduce costs, improve system performance, and promote ecosystem functions		
	10a. Efficiency and Consistency	1) Reduction in long-term O&M costs ($ or %) 2) Improved system performance or reliability	

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Draft Objective Topics and Potential Metrics (Continued)

CVFPP Goal	Objective Topics	Potential Metrics	Comments ✓ *Are these the appropriate metrics for the objective topic? If not, what other metrics should be considered?* ✓ *Which potential metric(s) would be most effective in measuring the objective topic?*
Improve Institutional Support	**11. Collaboration and Regional Governance –** Increase collaboration among flood managers, regulatory agencies, conservation planners, non-governmental organizations, agricultural and other interests		
	11a. Collaboration and Governance	1) Number of multi-agency / multi-interest projects implemented 2) Number of maintaining agency partnerships or consolidated local maintaining agencies formed (or, reduction in the total number of SPFC maintaining entities) 3) Number of regional resource management groups formed	
	12. Sustainable Funding – Improve the long-term sustainability of flood management funding		
	12a. Funding	1) Number of new local/regional/State funding mechanisms 2) Increase in the diversity of long-term funding mechanisms for SPFC improvement, maintenance, and repairs	
	13. Information and Tools – Improve the quality and availability of information and tools that inform flood management		
	13a. Information and Tools	1) Number of datasets or tools available to public	
	14. Project Approvals – Improve the efficiency of project implementation (time and cost of approvals), and success of conservation and mitigation		
	14a. Permit Costs	1) Reduced average cost of project permits and other regulatory requirements ($/project, or % project cost) 2) Reduced total cost for permitting SPFC flood management activities (as a portion of total cost)(%) 3) Reduced cost of mitigation (total or per credit)	
	14b. Efficiency	1) Reduced time to acquire permits (days/project, average, or % reduction in average time for approvals) 2) Increase in acreage covered by regional or consolidated permitting mechanisms (acres, or % of total acres) 3) Amount of advance mitigation lands acquired (acres)	
Promote Multi-Benefit Projects	**15. Integrated Water Management –** Promote design of multi-benefit projects that integrate other resource needs (ecosystem, water supply, recreation, etc.), where feasible		
	15a. Multi-benefit Projects	1) Funding allocated to multi-benefit projects ($ or % of total) 2) Number of multi-benefit flood management projects implemented 3) Number of projects that integrate and/or complement the integrated water management objectives of other projects/programs	